

Data package Saidenbach reservoir in situ

- Metadata -

Lothar Paul, Technische Universität Dresden, Ökologische Station Neunzehnhain

Lothar.Paul@tu-dresden.de

The data package contains the file **Saidenbach_Basic-characteristics.pdf** with basic information on history of the dam, structural details of the dam's wall, characteristics of the catchment area, sampling stations at the main inlets, the pre-dams, and the basin's morphometry.

The following sets of in-situ data are given:

- **Saidenbach_Water-temperature.csv**
- **Saidenbach_Oxygen.csv**
- **Saidenbach_pH.csv**
- **Saidenbach_Cond.csv**
- **Saidenbach_Turbidity.csv**
- **Saidenbach_Chem.csv**
- **Saidenbach_Transparency**

All files contain data gathered by the Ökologische Station (until 1990 Hydrobiologisches Laboratorium) Neunzehnhain (Lab N) and by the Reifland laboratory of the Landestalsperrenverwaltung Sachsen (Lab S; usually since 1993).

This file contains for each dataset tables with general information on the units of the values given, the period of time in which the data were gathered, typical depth (z-incr) and time (t-incr) resolution of the measurements, the measuring or analytical methods used applied.

Sampling and *in situ* measurements were mainly performed weekly or fortnightly in summer and winter at the main sampling station about 100 m in front of the dam near the deepest point of the reservoir between 7:30 a.m. and 10 a.m. Since 2002, sampling from ice was no longer allowed and, thus, there are longer intervals without data in winter. Water samples have been taken with a 2 L Ruttner vessel from different depths between surface and bottom, filled into narrow-mouth LDPE bottles, immediately transported to the lab, kept cool and – if necessary – usually filtered within 3 hours.

Dataset: Saidenbach_Water-temperature.csv

Variable	Lab	Period	z-incr (m)	t-incr (weeks)	Method	Reference
WT Water temperature (°C)	N	Phase 1: 1963 – 1964 1966 – 1970	Different 2, 5, 10	variable (see Fig. 1)	Calibrated mercury thermometer mounted inside a Ruttner sampler (reading accuracy of 0.1 K)	HÖHNE (1970) HOFMANN (1973)
		Phase 2: 1975 – 4/1976		1		
		Phase 3: 5/1976 – 8/1990	Usually 1	1 (until 1985) 2	Thermistor based device (Wheatstone bridge), reading accuracy 0.02 K	KNOLL (1976)
		Phase 4: 9/1990 – 2016		2 (1) (see Fig. 1)	WTW pH 196 T, since 2006 WTW pH/mV-Meter pH 197i + TA pH-60; reading accuracy 0.1 K	
	S	1993 – (6/2017)		variable	WTW pH 196 T (1992 – 2001), Multi-Parameter Water Quality Sonde YSI 6820 (2002), WTW pH 197 (2003 – 2012), Multi- Parameter Water Quality Sonde YSI 6820 (since 2013)	

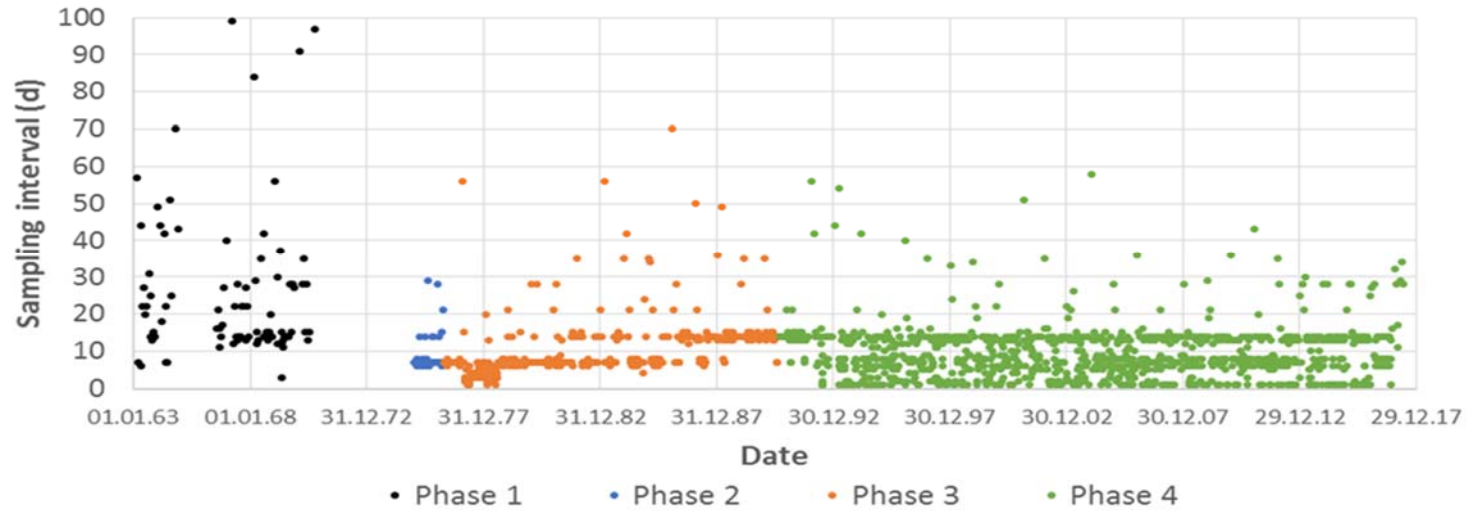


Figure 1: Sampling intervals during 4 phases of temperature profile measurements at the Saidenbach Reservoir (Phase 4 including Lab-S-series).

Dataset: Saidenbach_Oxygen.csv

Variable	Lab	Period	z-incr (m)	t-incr (weeks)	Method	Reference
OXY Oxygen concentration (mg L ⁻¹)	N	1975 – 1990	Usually 1	1 until 1985 2 later on	Iodometric method according to WINKLER	AMW* (DIN 38 408-21)
		1991 – 2006		mostly 2 (see Fig. 2)	WTW Oxi 196 T, depth armature TA 196 OXI-60, battery stirrer BR 190	
		2007 – 2010			WTW Oxi 197i, depth armature TA 197 OXI-60, battery stirrer BR 325	
		2011 – 2016			Digital optical dissolved oxygen meter YSI ProODO, 60 m sensor	
	S	1993 – 2001		variable (see Fig. 2)	WTW Oxi 196 T, depth armature TA 196 OXI-60, battery stirrer BR 190	
		2002 – 2012			Multi-Parameter Water Quality Sonde YSI 6820 (amperometric)	
		2012 – (7/2017)			Multi-Parameter Water Quality Sonde YSI 6820 (optical sensor)	

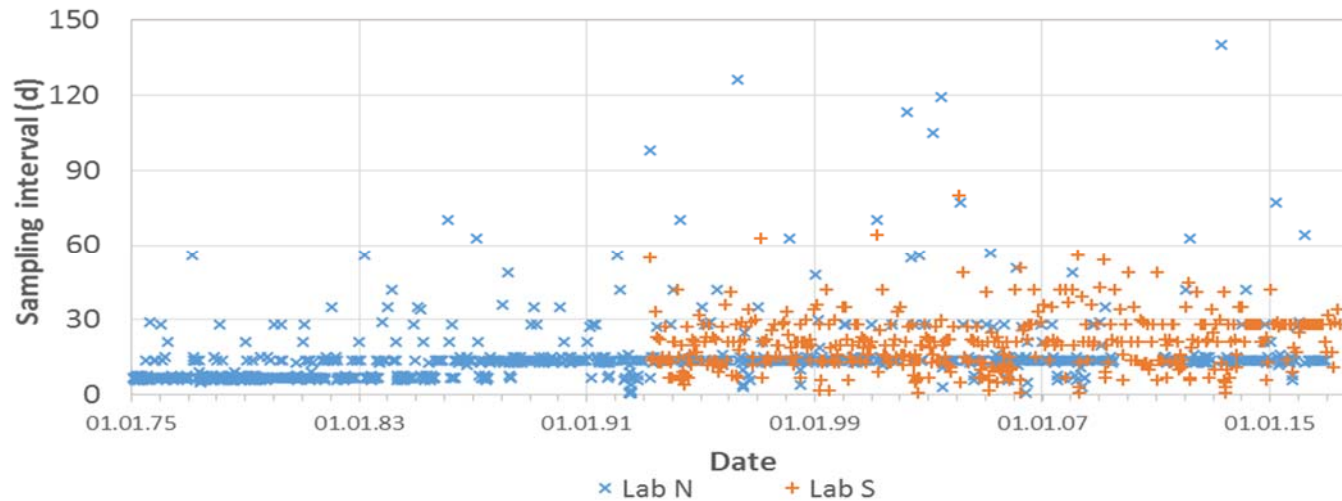


Figure 2: Sampling intervals of oxygen profile measurements at the Saidenbach Reservoir performed by Labs N and S.

OSI O2-saturation (%)	S	See OXY (lab S only)				
--------------------------	---	----------------------	--	--	--	--

Dataset: Saidenbach_pH.csv

Variable	Lab	Period	z-incr (m)	t-incr (weeks)	Method	Reference
PH	N	1983 – 1990	Different 2, 5, 10	Mostly 2 (see Fig. 3)	In-lab electrometric measurement	AMW*
		1991 – 2005	Usually 1		WTW pH 196 T	DIN 38404-5
		2006 - 2016			WTW pH/mV-Meter pH 197i + TA pH-60	
	S	1993 – 2001			WTW pH 196 T	
		2002			Multi-Parameter Water Quality Sonde YSI 6820	
		2003 – 2012			WTW pH 197i	
	2013 – (6/2017)	Multi-Parameter Water Quality Sonde YSI 6820 (see attachment 1)				

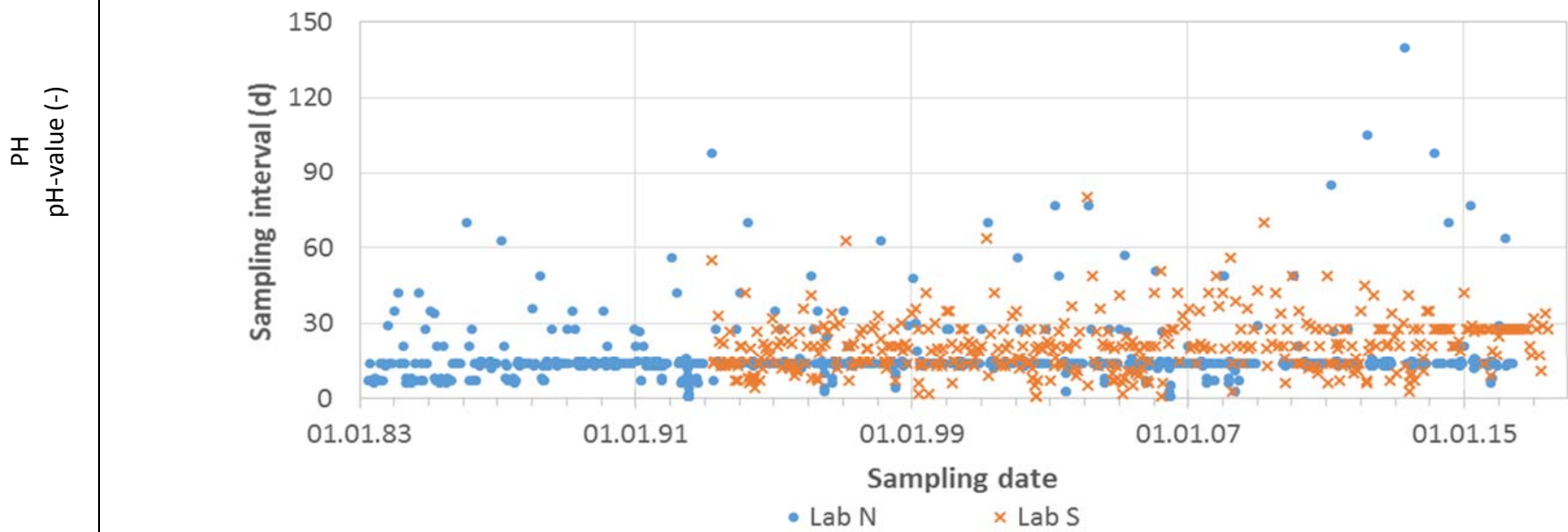


Figure 3: Sampling intervals of pH profile measurements at the Saidenbach Reservoir by labs N and S.

Dataset: Saidenbach_Conc.csv						
Variable	Lab	Period	z-incr (m)	t-incr (weeks)	Method	Reference
CON20 Conductivity referenced to 20 °C ($\mu\text{S cm}^{-1}$)	N	1991 – 2005	1	Mostly 2 (see Fig. 4)	WTW LF 196 T	
		2006 - 2016			WTW ProfiLine Cond 1970i + TA 197 LF	
CON25 Conductivity referenced to 25 °C ($\mu\text{S cm}^{-1}$)	S	1993 – 1994			WTW pH 196 T	
		1995 – 2001			Multi-Parameter Water Quality Sonde YSI 6820 (see attachment 1)	
		2002 – (6/2017)				

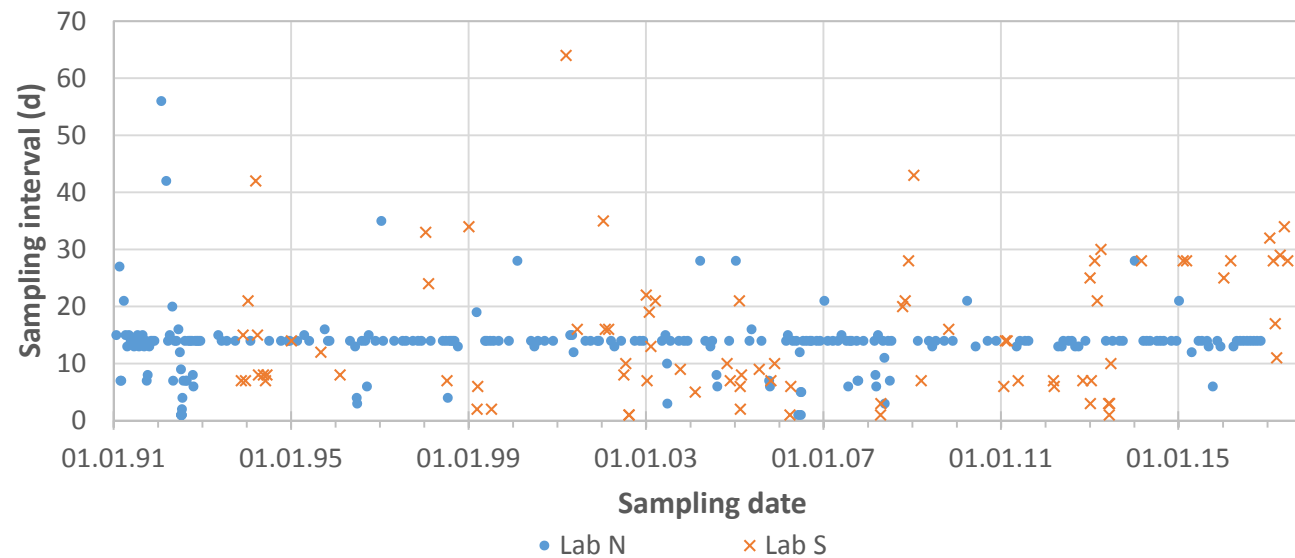


Figure 4: Sampling intervals of conductivity measurements at the Saidenbach Reservoir by labs N and S.

Dataset: Saidenbach_Chem.csv (Lab N only, depth increments variable, t-increments see Fig. 5)

Variable	Shortcut	Unit	Period	Analytical method	Reference
Soluble reactive phosphorus	SRP	$\mu\text{g L}^{-1}$ $\text{PO}_4^{3-}\text{-P}$	1975 - 2016	Photometric after filtration through 0.45 μm membrane filters, molybdenum blue method	Before 1990: AMW* Later: DIN 38 405 D 11-1
Total dissolved phosphorus	DP				
Total phosphorus	TP			Photometric after digestion with sulfuric acid and H_2O_2 (before 1990) or $\text{K}_2\text{S}_2\text{O}_8$ under pressure (since 1991)	
Nitrate	NO3	mg L^{-1} NO_3^-		Before 1990: Photometric analysis with sodium salicylate	AMW*
				Since 1991: UV-self-absorption of the filtered sample	Application GA No. 1, Dr. Bruno Lange GmbH Berlin
Dissolved silica	DSI	mg L^{-1} Si	1981 - 2016	Photometric determination of orthosilicate as silicomolybdate	Before 1990: AMW*
					Since 1991: DIN 38 405-D21
Acid capacity	AC	mval L^{-1}	1985 - 2016	Titration, since 1998: Titrator Titrino (Metrohm)	Following DIN 38409-7

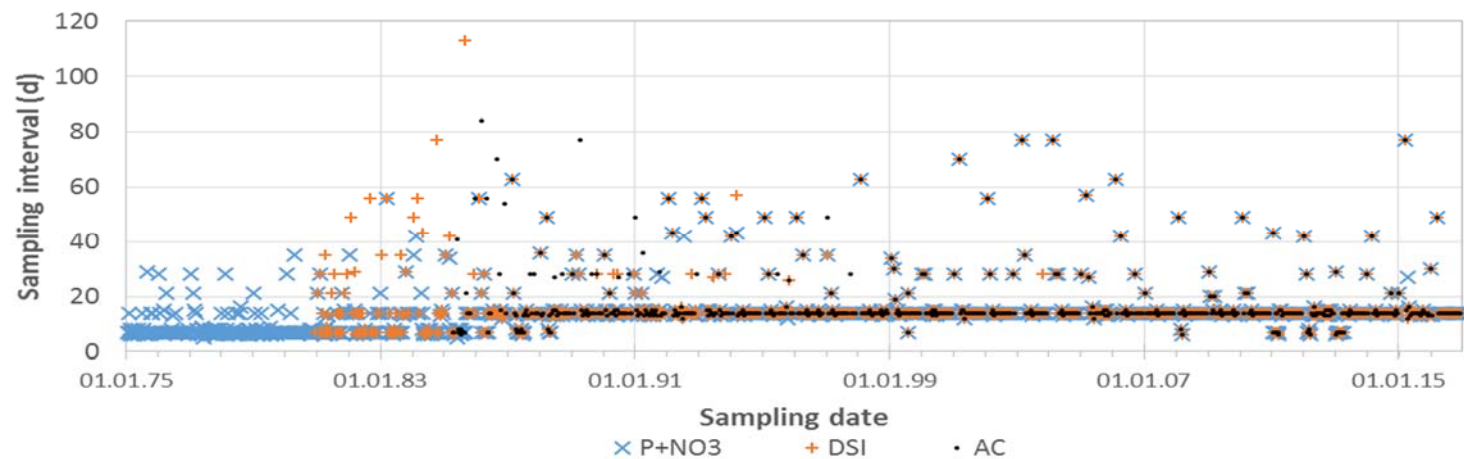


Figure 5: Sampling frequency of the determination of the concentrations of phosphates and nitrate (P+NO3), dissolved silica (DSI), and acid capacity (AC) at the Saidenbach Reservoir performed by Lab N.

Dataset: Saidenbach_Chlorophyll.csv						
Variable	Lab	Period	z-incr (m)	t-incr (weeks)	Method	Reference
CHL Chlorophyll ($\mu\text{g L}^{-1}$ Chl-a)	N	1994 – 2014	Mostly 1	Mostly 2 (see Fig. 6)	BackScat in situ Xe-flashlight fluorometer, Dr. Haardt Optik & Mikroelektronik, Klein Barkau, Germany	
FLP Chlorophyll ($\mu\text{g L}^{-1}$ Chl-a)		2015 – 2017			In-vivo chlorophyll-a measurement with FluoroProbe III, bbe Moldaenke GmbH, Schwentimental, Germany	

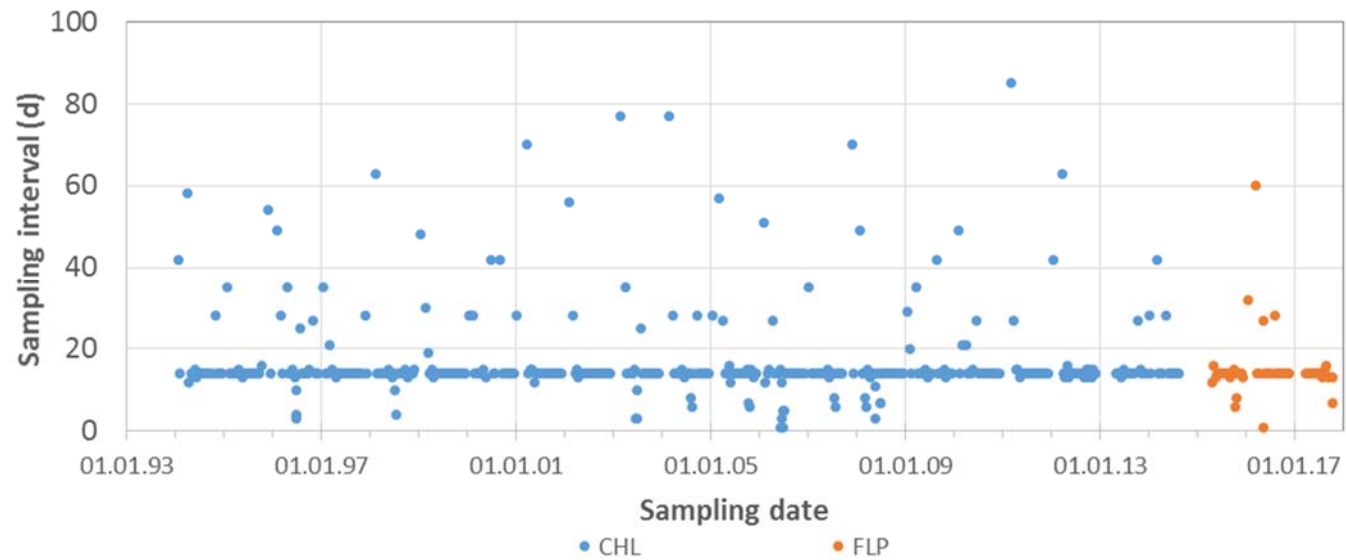


Figure 6: Sampling intervals of chlorophyll-a measurements at the Saidenbach Reservoir by lab N.

Dataset: Saidenbach_Turbidity.csv						
Device	Variable	Lab	Period	z-incr (m)	t-incr (weeks)	Method
BTM	Beam attenuation (%)	N	1976 - 2000	Mostly 1	Mostly 2 (see Fig. 7)	Beam Transmittance Meter (Ph. Schenk, Wien, Austria): Measurement of the transmittance Tr (%) of a beam of parallel light after passing a water layer of 1 m (reference: Tr in air = 100 %); Beam attenuation (%) = 100 – Tr .
BackScat	Turbidity (TEF = FAU)		1992 - 2013			Measuring backscattering with BackScat in situ Xe-flashlight fluorometer, Dr. Haardt Optik & Mikroelektronik, Klein Barkau, Germany
TMS			2000 - 2016			120° infrared scattering, Nephelometer TMS 200/H (SMT&HYBRID GmbH, Weißig, Germany)
MoniLog		1993 - 2000	90° scattering, Monilog E/R, Monitek-Metrisa, Düsseldorf, Deutschland			
YSI		2002 - 2017	Turbidity sensor YSI 6136, 90° scattering (see attachment 1)			
		S	2001			
			2002 - 2017			

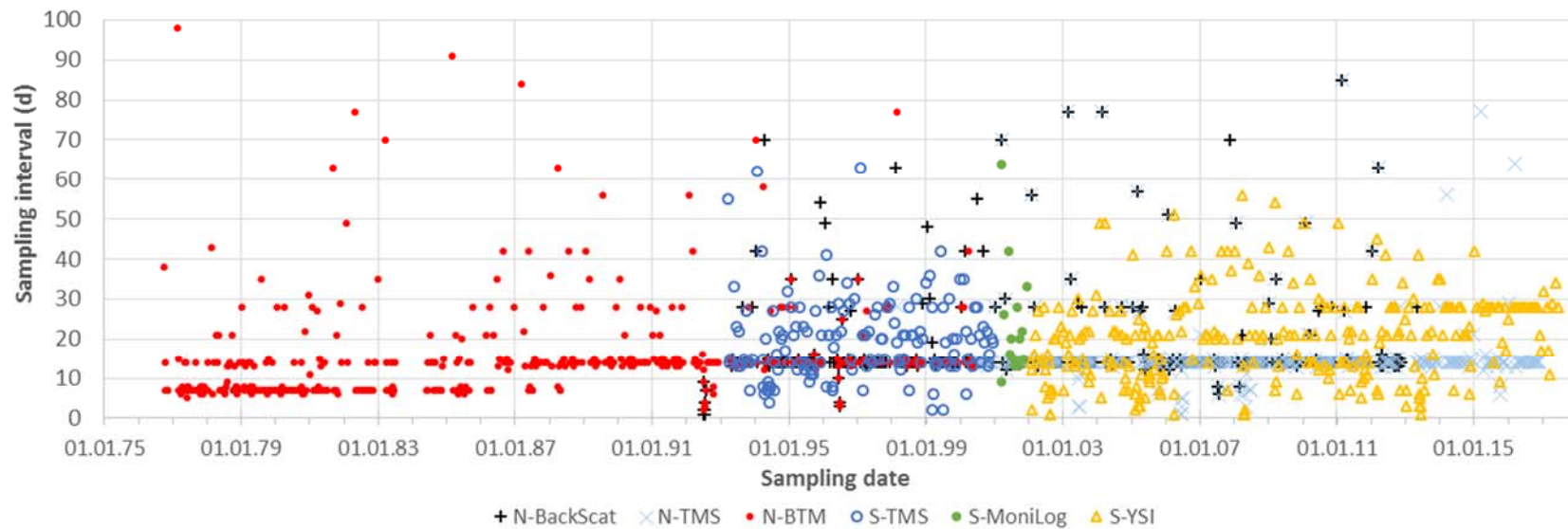


Figure 7: Sampling intervals of turbidity measurements at the Saidenbach Reservoir (N – lab N, S – lab S; devices see table).

KNOLL, W., 1976 : Ein neues Gerät für die Messung von Wassertemperaturen. - Wasserwirtschaft-Wassertechnik 26: 73-74.

Sauberer, F., 1962: Empfehlungen für die Durchführung von Strahlungsmessungen an und in Gewässern. Mitt. Internat. Verein. Limnol. No. 11, Stuttgart.